Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1237-Alaska Community LCS Air Monitoring Network Propo

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: Ms. First Name: Heidi Middle Name:
Last Name: Thomerson Suffix:
Title: Federal Grant Accountant

Complete Address:

Street1: 555 Cordova St
Street2:
City: Anchorage State: AK: Alaska
Zip / Postal Code: 99501 Country: USA: UNITED STATES
Phone Number: 907-269-7607 **Fax Number:**
E-mail Address: heidi.thomerson@alaska.gov

Payee: *Individual authorized to accept payments.*

Name: Prefix: Ms. First Name: Heidi Middle Name:
Last Name: Thomerson Suffix:
Title: Federal Grant Accountant

Complete Address:

Street1: 555 Cordova St
Street2:
City: Anchorage State: AK: Alaska
Zip / Postal Code: 99501 Country: USA: UNITED STATES
Phone Number: 907-269-7607 **Fax Number:**
E-mail Address: heidi.thomerson@alaska.gov

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: Ms. First Name: Carmen Middle Name: M
Last Name: Lueras Suffix:
Title: Administrative Operations Manager

Complete Address:

Street1: 555 Cordova St
Street2:
City: Anchorage State: AK: Alaska
Zip / Postal Code: 99501 Country: USA: UNITED STATES
Phone Number: 9072693010 **Fax Number:**
E-mail Address: carmen.lueras@alaska.gov

EPA Form 5700-54 (Rev 4-02)

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: Prefix: Mrs. First Name: Barbara Middle Name: E

Last Name: Trost Suffix:

Title: Program Manager

Complete Address:

Street1: 555 Cordova St

Street2:

City: Anchorage State: AK: Alaska

Zip / Postal Code: 99501 Country: USA: UNITED STATES

Phone Number: 907-269-6249 **Fax Number:**

E-mail Address: barbara.trost@alaska.gov

Data quality management personnel and organizational approach

Name: Meyliana Wu

Position: Quality Assurance Supervisor

Qualifications: Chemical Engineering (BSc)

Experience: 7 years in Quality Assurance (QA), including 2 years as QA Supervisor

Tasks and responsibilities: Looks after the whole process of data quality management and supervise a Quality Assurance (QA) engineer, and Quality Control (QC) chemists who are also supervised by Chemistry Supervisor, Kyle Robinson. Quality Control (QC) chemists who are working side-by-side with instrument's operator whose tasks include but not limited to calibration chemist who will perform routine calibrations, precision checks and audits and an electronic/field technician who will maintain instrument's daily operation. The QA engineer validates criteria pollutants, continuous $PM_{2.5}$, non-continuous NO_2 and O_3. In addition to supervising the QA engineer and QC chemists, the QA supervisor will also validate Volatile Organic Compounds (VOCs) data and does the final checks on reviewed criteria pollutants. The EPA QA Handbook Volume II is used as validation tool for criteria pollutants data processing and the NAATS Tad Rev. 3 is used as a guidance in processing VOCs/ air toxics data.

Quality Assurance Statement:

AMS lab gives high importance to maintaining a culture of excellent data quality management. Standard Operating Procedures (SOPs) will be established for every major step of sample collection, sample analysis, and data quality control/quality assurance operations. These SOPs will be followed in a manner that assures the most applicable and highest quality data are obtained. All data shall be of a known and documented quality. Operators must follow the manuals and instructions provided by the equipment manufacturers during equipment testing, installation, and retrieval. Unique procedures should be outlined for each specific case of pollutants in aspects of data collection and measurement techniques such as sampling, calibration, reading and analyzing. The procedures must follow established EPA and other useful guidelines and should be able to produce a quality data acceptable for Environmental reporting. Diurnal, weekly, monthly, seasonal, and or yearly trends and spatial patterns should always be considered in setting up experiments and establishing facts and preparing reports.

The QA officer will make several plots of the monitoring data periodically. Visual and graphical methods are to be applied to determine data issues and outliers. Co-located sample pairs and background concentrations will be examined. These data plots and QA SOPs will help identifying any data quality issues in a timely manner, and corrective actions will be taken immediately when any data quality issue is identified. Results from this monitoring project will be compared with those from the conventional sampling at nearby AMS sites and canister sampling method analyzed by Multi-Detector GC. Co-located samples and blanks will be used as part of data quality control measures. Co-located samples are in good agreement when both slope and R^2 values are close to 1 and the intercept is close to 0.

Activities involving QA processes in this project include:

- Receiving demonstration of active sampling at RIT site and other sites in the community.
- Coordinating with various Philadelphia agencies and neighborhoods where equipment will be located.
- Setting up sites.
- Capturing data and conducting Quality Control/Quality Assurance.
- Preparing Quarterly Reports on target compound concentrations.
- Finalizing quarterly reports with enhanced data analysis.

Sampling results will be made available on open portal after quality assured.

Data Analysis

There are several things to be considered prior to validating the data such as typical data trends, levels of other pollutants, observations at other sites and site characteristics. Diurnal and seasonal patterns help data analyst to understand possible impacts on data aggregations when some data are missing. This project will examine seasonal and daily variance if there is any, in $PM_{2.5}$, NO_2 and air toxics concentrations. The data will be able to show whether or not certain pollutants peak during warm season or cooler season or invariant and which pollutants are peaking during morning hours, mid-day, night-time or invariant. $PM_{2.5}$ is a site-specific pollutant, meaning its concentration typically depends on activities near the site and usually is non-time dependent. However, $PM_{2.5}$ may be significantly higher during cooler season. On the other way, NO_2 is a time-dependent pollutant; it will be higher mostly during morning and evening rush hours due to increased traffic volume. Benzene and 1,3-Butadiene are typically higher on cooler season and morning hours of a day. Levels of other pollutants that are monitored are helpful to determine validity of a pollutant. For example, benzene's high concentration may be valid when other pollutants (such as toluene, ethylbenzene and xylenes) that have similar sources also were elevated. High concentrations of a pollutant at several sites in an area on the same date may indicate a real emission event or air inversion. Also, samples taken near emission source will be very likely showing high concentrations for a particular pollutant that was emitted by nearby source.

Data completeness criteria shall be determined, e.g., 75% data captured. $PM_{2.5}$ and NO_2 are to be measured continuously (1-minute data). For $PM_{2.5}$, in order the data to be valid, in a day, there must be at least 18 valid hours in which there are at minimum of 45 valid minutes for hourly data. For NO_2, hourly data is used and there has to be at least of 45 valid minutes to validate the hourly data. Completeness criteria are necessary in creating valid aggregated values (such as annual averages) to verify that the distribution of measured values within the aggregation window is representative of that entire period. Incomplete data may cause the seasonal averages to be either biased low or biased high. Valid 7-day averages, 14-day averages, monthly averages, quarterly averages and annual averages are to be taken for statistical analysis. Monthly averages will be a good starting point to generate seasonal variability/ pattern.

When data are suspiciously high, that could cause the data to be biased high. To prevent such data to be included, an upper/lower limit is to be set to remove outliers or if such data is used, a proper flagging is to be set. Data below detection limit can provide insight into the lower concentration distribution and must not be removed or altered. Data below detection limit will be reported as it is and further analyzed.

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1234-AMS Quality Assurance Statement 3-15-2022.pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/18/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier: Choose State...

8. APPLICANT INFORMATION:

* a. Legal Name: City of Philadelphia

* b. Employer/Taxpayer Identification Number (EIN/TIN): 236003047

* c. Organizational DUNS: 8344664630000

d. Address:

* Street1: 321 S. University Ave
Street2: 2nd floor
* City: Philadelphia
County/Parish:
* State: PA: Pennsylvania
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 19104-4543

e. Organizational Unit:

Department Name: Public Health

Division Name: Air Management Services

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Kassahun
Middle Name:
* Last Name: Sellassie
Suffix: Ph.D.

Title: AMS Program Director

Organizational Affiliation:

* Telephone Number: 2156857584
Fax Number: 2156859451

* Email: Health.EPAGrant@phila.gov

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

C: City or Township Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

American Rescue Plan - Air Management Services

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: PA-001 * b. Program/Project: PA-001

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 11/01/2022 * b. End Date: 10/31/2024

18. Estimated Funding ($):

* a. Federal	392,658.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	392,658.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☒ a. This application was made available to the State under the Executive Order 12372 Process for review on 03/18/2022.

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☐ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:	
* First Name:	Cheryl
Middle Name:	
* Last Name:	Bettigole
Suffix:	M.D.
* Title:	Public Health Commissioner
* Telephone Number:	2156855674
Fax Number:	2156865212
* Email:	Health.EPAGrant@phila.gov
* Signature of Authorized Representative:	Jane A Baker
* Date Signed:	03/18/2022

Attachment 1 – Quality Assurance Statement

DEC follows a Data Validation Standard Operating Procedure (SOP) for data validation and verification of continuous and filter-based monitoring data, either collected by DEC or subject to regulatory review by DEC. The Data Validation SOP is to standardize the process of flagging, annotating, reviewing, and uploading air monitoring data for submission to the U.S. Environmental Protection Agency's (EPA) Air Quality System (AQS) database. This Data Validation SOP will not be used for management of the AQMesh data, but DEC staff are familiar with the concepts and procedures. A Standard Operating Procedure (SOP) and Quality Assurance Project Plan (QAPP) are in draft and will be finalized before the project begins.

The Program's Quality Assurance Auditor Brie Van Dam (see role and experience in Attachment 2) will be responsible for overseeing the QA/QC aspects of the project. The data quality indicators used for the assessment of the Measurement Quality Objectives (MQOs) include precision, bias, comparability, reasonableness, and completeness.

Precision, Bias, Comparability

AQMesh performs a colocation study with all pods at a reference station at the UK factory before shipping the pods to customers. The colocation utilizes a Thermo Scientific 42i for NO, NO_2 and NO_x, Thermo Scientific 43i for SO_2, Ecotech Serinus 10 for O_3 (not used in DEC's configuration), Ecotech Serinus 30 for CO, and FIDAS 200 for PM_1, $PM_{2.5}$, PM_4 and PM_{10}. Once the AQMesh pods are received in Alaska, DEC will conduct a 'starting bracket' 2-4 week colocation study. During the colocation study, the AQMesh pods will be stationed at an existing Federal Equivalent Method (FEM) site with a $PM_{2.5}$ BAM monitor to compare the accuracy and precision of the particulate matter instruments. When possible, pods will be deployed at the NCore site in Fairbanks to compare the AQMesh electrochemical gaseous sensor performance with regulatory gaseous monitors in the Alaska climate. The AQMesh gas sensors takes samples every 10 seconds, and the particle counter takes 60 second samples. The samples are then averaged over 15 minutes and reported as 15-minute concentrations. The 15-minute averages will be averaged over an hour, if meeting the 75% reporting criteria, to compare to the hourly concentrations of the BAM. The results will be compared to the EPA's Performance Testing Protocols[1], see Table below. Based on the colocation study, data can be scaled prior to deployment in the field and will be reported to the AQMesh online repository in pre-scaled and scaled datasets. Upon completion of the field study, an 'ending bracket' colocation can be conducted to assess bias and precision over the study's duration.

Once installed, AQMesh pods will run independently with only remote data review. Due to the distance and cost to reach the various study communities, a 'gold standard pod' will be used as an audit tool to scale the deployed pods on a rotating basis as staff are available. No in-field calibrations or adjustments will occur during the study. The gas sensors are recommended to be replaced on a two-year basis and will give an alarm on the AQMesh data repository when replacement is needed.

[1] U.S. Environmental Protection Agency, Office of Research and Development, Center for Environmental Measurement and Modeling, Performance Testing Protocols, Metrics, and Target Values for Fine Particulate Matter Air Sensors, February 2021.

Recommended Performance Metrics and Target Values for $PM_{2.5}$ Air Sensors

Performance Metric		Target Values for Base Testing (Colocation)
Precision	Standard Deviation (SD) -or- Coefficient of Variation (CV)	≤ 5µg/m³ (SD) – or - ≤ 30% (CV)
Bias	Slope	1.0 ± 0.35
	Intercept (b)	-5 ≤ b ≤ 5 µg/m³
Linearity	Coefficient of Determination (R2)	≥ 0.70
Error	Root Mean Square Error (RMSE) or Normalized Root Mean Square Error (NRMSE)	RMSE ≤ 7 µg/m³ or NRMSE ≤ 30%

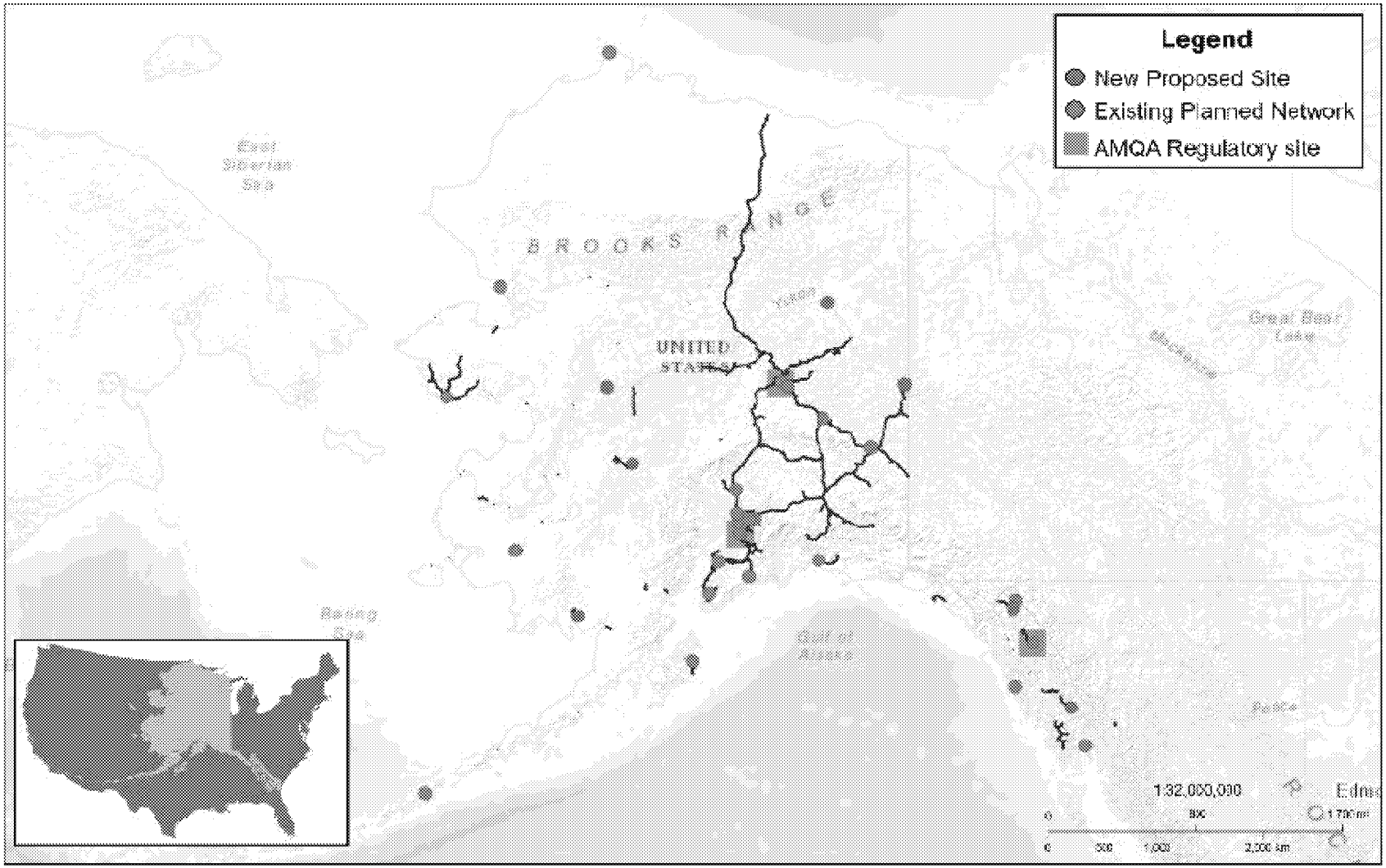
Reasonableness and Completeness

Data will be reviewed daily at a cursory level to ensure data is reporting and reasonable. If data is missing, DEC will reach out to the local community member(s) with sustained non-reporting pods or sensors to assess cause, i.e. unplugged, antenna moved, no data connection, etc. If elevated concentrations are reported, DEC will discuss the data with the community member(s) to determine possible sources and reasonableness. Meteorological parameters (RH, BP and ambient temperature) will be used to assess general pod performance and reasonability compared to local conditions if nearby weather stations are available. DEC will communicate with community members for routine visual inspections of the pods to ensure the sensor is generally clean, i.e. no buildup of snow, dirt, rime frost, antenna positioned, etc. The data completeness goal is ≥75% data recovery for hourly averages.

Data Management

Although partnering with various organizations and communities, DEC is responsible for data management and processing. Data collected by the AQMesh sensor pods is reported to the online database (https://www.aqmeshdata.net). There is no date of expiration for the online database, but DEC conducts regular manual downloads to store the data locally on the State servers. For real-time data reporting to the DEC webpage, DEC relies on the coded diagnostics auto-applied to data by AQMesh (referred to as Pre-Ratification process by AQMesh[2]). These coded diagnostics will flag any suspicious data, which prevents it from being reported to DEC's real-time webpage. DEC will then investigate the flagged data in a timely manner to determine if flags are valid by comparing the data to available FEM stations, local weather data, or observations from citizen scientists. The meteorological parameters will not be reviewed past the extent of occasional comparison to local weather data.

[2] AQMesh, Standard Operating Procedure, Gas Algorithm V5.0, AQMSOP3.1.


Legend
New Proposed Site
Existing Planned Network
AMQA Regulatory site
BROOKS RANGE
UNITED STATES
1:32,000,000
0
500
1,000
2,000 km

Attachment 3: Key Staff Resumes

1. BARBARA TROST, PROGRAM MANAGER

DEC Air Quality, Monitoring and Quality Assurance
555 Cordova St
Anchorage, AK 99501
(907)-269-6249
barbara.trost@alaska.gov

EDUCATION:

- M.S. Physics, State University of New York Albany (SUNYA)
- M.S. (Diplom) Physics, University of Heidelberg, Germany (U Heidelberg)
- M.S. Atmospheric Chemistry, University of Alaska Fairbanks (UAF)

WORK HISTORY

- **Air Monitoring and Quality Assurance Program (AMQA), Alaska Department of Environmental Conservation (DEC), Anchorage, AK 2008- Present**
  - Manage the State's Air Quality Monitoring and Quality Assurance Program to ensure compliance with the National and Alaska Ambient Air Quality Standards
  - Statewide evaluation of ambient air quality, working with the public to address sources of air pollutants, and providing technical support to federal, local and tribal governments and industry on air monitoring
  - Develop spending plans and program budgets, proposals and manage grants and contracts.
  - The program conducts measurements at the State's regulatory monitoring sites, issues air quality advisories statewide for man-made pollution, wind-blown dust, wildland fire smoke and volcanic ash, conducts emergency monitoring and special studies.
  - Provide technical assistance to the Permit Program and other state, federal and local agencies on quality control and air monitoring questions.
  - Present scientific and technical data to diverse audiences, represent the state in international, federal, state and local work groups

- **AMQA Field Monitoring Section Manager, Anchorage, AK 2006-20008**
  - Managed and supervised the Field Monitoring Section of the Air Monitoring and Quality Assurance Program
  - Assessed and evaluated air quality issues statewide and implement air quality projects.
  - Assigned, directed, and supervised staff of the Field Monitoring Section in the day-to-day implementation of projects and program functions, necessary to fulfill the program's statutory mission.
  - Coordination and intense interaction with local governments, federal agencies, tribes and other groups impacted by the program is common
- **Environmental Program Specialist, Anchorage, AK, 2001-2006**

- Managed statewide air monitoring and special field investigations. Responsible for design, management, and operation of ambient air quality monitoring projects statewide.
- Projects included criteria pollutant monitoring and Tribal Air Monitoring.
- Worked closely with state, federal, local, tribal and village government environmental managers and academia to assess air quality for compliance with state and federal standards and designed successful monitoring programs for abatement of elevated pollution.
- Managed data review and reporting of Alaska's air monitoring data to EPA's Air Quality System (AQS).

Prior Work History (1991-2001)

- Technician, Research and Teaching Assistant, (U Heidelberg, UAF)
  Over 30 years of experience measuring air pollution and assessing air monitoring technologies. has graduate degrees in physics and atmospheric chemistry.
- Conducted research in atmospheric physics and chemistry (SUNYA, U Heidelberg, UAF)

Select Project experience

- Grant Management
  Responsible for directing and supervising the tracking of program funds and purchase requisitions to assure appropriate and timely expenditure of grant and special project funds for required equipment and contractual services. Tasks include developing a detailed spending plan that meets program objectives within the funds available, negotiate financial agreements to implement Memoranda of Understanding for local air quality programs and studies, responsible for budget development for the program, and reporting to EPA.
- Rural Monitoring
  Managed numerous monitoring studies in remote areas of Alaska including the Kotzebue Road Dust Study, supported the Native Village of Noatak and Buckland with their CAA grant monitoring project, road dust monitoring in the Native Villages of Ambler, Kiana, Kivalina, Noorvik, Selawik, St Mary's, Mekoryk, Ruby, Seldovia, assisted monitoring in Bethel and Skagway, wildland fire smoke monitoring in Ft Yukon and Galena.
- Quality Assurance
  Managed the development of the DEC Division of Air Quality Management Plan and DEC Quality Assurance Project Plans since 2006. Manage the development of Standard Operating Procedures (SOP). Collaborate with the Institute for Tribal Environmental Professionals (ITEP) and participate in Air Quality Trainings and QAPP trainings as instructor. Assist and support tribes and local governments with development of project specific QAPPs and SOPs and review Industry QAPPs prepared in support of PSD level data collection needed for permit applications.

2. BRIE VAN DAM, QA OFFICER
   AK DEC Division of Air Quality, Air Monitoring and Quality Assurance
   610 University Ave.
   Fairbanks, Alaska 99709
   (907) 451-2370

Education

- Ph.D. Atmospheric and Oceanic Sciences, University of Colorado, Boulder, 2013
- B.S.E. Earth Systems Science and Engineering, Univ of Michigan, Ann Arbor, 2007

Relevant Work History

- **Chemist IV, Air Monitoring and Quality Assurance Program, Division of Air Quality, Alaska Department of Environmental Conservation (DEC), Fairbanks, AK, Oct 2021 – Present**
  - Auditor and Quality Assurance Chemist

- **Alaska Science Lead, Snowchange Cooperative, Fairbanks, AK, 2018-2021**
  - Worked in collaboration to develop community-led environmental monitoring programs with Indigenous partners in Alaska and Canada, including co-organizing workshops to determine community needs, environmental monitoring and training, school curriculum development, data analysis and sharing
  - Analysis and visualizations of long-term environmental data sets for community partners
  - Contributing author to IPCC AR6 Cross-Chapter Paper on Polar Regions

- **Environmental Data Center Manager, Toolik Field Station, University of Alaska, Fairbanks, 2013-2018**
  - Lead the baseline environmental monitoring program at the Toolik Field Station in the northern foothills of the Brooks Range.
  - Managed and worked alongside seasonal staff to collect and disseminate baseline environmental and biological data and provided common use laboratory and field equipment to the field station community.
  - Assisted researchers in a variety of technical field support including proficiency with a range of atmospheric, hydrological, and biological sampling methods.
  - Contributed to development of 5-year Cooperative Agreement with the NSF, and proposed and managed departmental budget.
  - Appointed member of University of Alaska Fairbanks Chancellor's Inclusion, Diversity, Equity and Accessibility Task Force 2018-2019
  - Co-led and co-organized series of workshops on inclusion, interpersonal safety and preventing sexual misconduct at field stations at the Organization of Biological Field Stations Fall Meetings 2017-2018.

- **Graduate Student Research Assistant, Institute of Arctic and Alpine Research, University of Colorado, Boulder 2008 – 2013**
  - Field researcher during multi-year campaigns measuring chemical fluxes of ozone, nitrogen oxides, and mercury using eddy covariance and direct gradient methods at Summit Station, Greenland, and Toolik Field Station, AK.
  - Worked with team of researchers to organize field campaigns including purchasing, building, testing and calibrating instruments and data acquisition systems, and experimental development.
  - Led the installation and operation of micro-meteorological, environmental, and chemical analysis instrumentation at field sites in CO, AK, UT, and Greenland.

Conducted data QA/QC and contributed to final processing, interpretation, manuscript preparation, and distribution of data to collaborators.
    - Organized and participated in multi-day data sharing workshops with collaborating researchers.

- **Research Assistant, University of Michigan Air Quality Laboratory, Ann Arbor, MI 2006-2007**
    - Assisted with field studies investigating wet and dry deposition of mercury in the Arctic based in Utqiagvik, AK, and at a network of urban and rural air quality sites across Michigan and Ohio.

3. TAYLOR BORGFELDT, DATA ANALYST
ADEC Division of Quality, Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-7573

Education/Professional Certifications

- Master of Science in Geosciences, University of Texas at Austin, 2017
- Bachelor of Science in Geosciences, University of Texas at Dallas, 2014

Relevant Work History

- **Environmental Program Specialist III, Division of Air Quality, Monitoring and Quality Assurance, Department of Environmental Conservation, Anchorage, AK, Aug. 2020 – Present**
    - Manage Division's data acquisition system, maintaining data communications for FEM sites
    - Led Community-Based Air Monitoring Pilot Project, building relationships with hub communities to deploy AQMesh air quality sensors to increase air quality data coverage
    - Perform 2nd level data review for regulatory data

- **Pollution Prevention Specialist, Minnesota Technical Assistance Program, Minneapolis, MN, Nov. 2019 – Aug. 2020**
    - Provided technical assistance to business throughout Minnesota to remove trichloroethylene (TCE) from their industrial process
    - Developed over 120 client relationships for source reduction of hazardous air emissions through technical assistance
    - Produced eight-part mini-series of webinars to inform and engage small-businesses using TCE

- **Environmental Geoscientist III, GIS Environmental Inc., Austin, TX, June 2019 – Nov 2019**
    - Managed environmental consulting projects for research and development or litigation
    - Large scale data management, quality assurance and quality control, data validation

- Designed and conducted field sampling investigations, including vapor intrusion, ground and surface water, and soil

Kachemak Bay National Estuarine Research Reserve
Alaska Center for Conservation Science
UNIVERSITY of ALASKA ANCHORAGE
2181 Kachemak Drive Homer, Alaska 99603 (907) 235-4799

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501

To Whom It May Concern:

I'm writing on behalf of Kachemak Bay National Estuarine Research Reserve (KBNERR) in support of Alaska Department of Environmental Conservation's Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

KBNERR worked with AMQA during the 2021 Community-Based Air Monitoring Pilot Project and received an AQMesh pod to monitor local air quality. The data produced by this project is available in real-time on the publicly accessible webpage, which is a unique feature of this project compared to previous air monitoring efforts. AMQA assisted with site selection to ensure the location met technical siting criteria, while KBNERR ensured the chosen deployment location was representative of the community and easily accessible by our staff.

KBNERR is a partnership between NOAA and the University of Alaska that conducts research and works to deliver scientific information to decision-makers and the general public in the Kachemak Bay region, and the air quality data collected by this project complements the continuous water quality and weather data we have been collecting in this region for more than 20 years. A key part of our mission is to connect science to local residents and students, and we envision using the air quality data in future outreach and education programs.

KBNERR believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other Alaskan communities.

Sincerely,

Steven J. Baird
Research Coordinator, Kachemak Bay NERR

KODIAK ISLAND BOROUGH
ENGINEERING/FACILITIES DEPARTMENT
710 Mill Bay Road
Kodiak, AK 99615
(907) 486-9340 Phone (907) 486-9394 Fax
dconrad@kodiakak.us

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501

To Whom It May Concern:

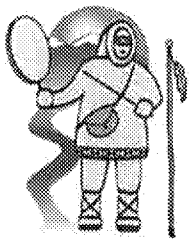
I write on behalf of the Kodiak Island Borough (KIB) in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

KIB worked with AMQA during the 2021 Community-Based Air Monitoring Pilot Project and received an AQMesh pod to monitor local air quality. The main goal of the project was to collect baseline air quality data to assess ambient conditions in the community. Being a part of this project also means Kodiak is part of the wildfire smoke real-time monitoring network, allowing our local leadership to take immediate action during wildfire season and smoke events. The data is available in real-time on the publicly accessible webpage, which is a unique feature of this projects compared to previous air monitoring efforts.

AMQA assisted with site selection to ensure the location met technical siting criteria, while KIB ensured the chosen deployment location was representative of the community and easily accessible by our staff. Since the pod's deployment, the data has been publicly available on the AMQA webpage. KIB believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other Alaskan communities.

Sincerely,

David Conrad
Director, E/F Department
Kodiak Island Borough
710 Mill Bay Road
Kodiak Alaska



MANIILAQ
ASSOCIATION

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501

To Whom It May Concern:

I write on behalf of Maniilaq Association in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

Maniilaq Association Office of Environmental Health (OEH) worked with AMQA during the 2021 Community-Based Air Monitoring Pilot Project and received an AQMesh pod to install and monitor local air quality. The main goal of the project was to collect baseline air quality data to assess ambient conditions in our rural community. The data is available in real-time on a publicly accessible webpage, which is a unique feature of this project compared to previous air monitoring efforts. Maniilaq intends to use this local project data to better understand air quality trends, protect public health, promote awareness, and inform educational efforts such as wildfire prevention and preparedness in schools.

AMQA assisted with site selection to ensure the location met technical siting criteria and has been an effective and responsive resource for any pod and data transmission troubleshooting. Maniilaq OEH monitors the data webpage on a regular basis, and if elevated concentrations are seen, AMQA and Maniilaq OEH discuss possible sources and reliability of data. Due to the strength of the partnership and usefulness of data available, Maniilaq Association believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other rural Alaskan communities.

Sincerely,

Christopher Dankmeyer
Environmental Health Manager
LCDR, US Public Health Service
Maniilaq Association
733 2nd Ave.
Kotzebue, AK 99752

NORTON SOUND
HEALTH CORPORATION

Providing quality health services and promoting wellness within our people and environment.

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501

To Whom It May Concern:

I write on behalf of Norton Sound Health Corporation (NSHC) in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

NSHC worked with AMQA during the 2021 Community-Based Air Monitoring Pilot Project and received an AQMesh pod to monitor local air quality. The main goal of the project was to collect baseline air quality data to assess ambient conditions in the community. The data is available in real-time on the publicly accessible webpage, which is a unique and important feature of this project. The community of Nome periodically experiences excessive levels of particulate matter in the air. Being a part of this project and having access to real-time data enables the community to make educated decisions when planning activities such as Head Start class field trips or other outside activities.

AMQA assisted with site selection to ensure the location met technical siting criteria, while NSHC ensured the chosen deployment location was representative of the community and accessible by our staff. Since the pod's deployment, the data has been publicly available on the AMQA webpage. If elevated concentrations are seen, AMQA and NSHC discuss possible sources and reliability of data. NSHC believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other Alaskan communities.

Sincerely,

Racheal Lee, REHS
Office of Environmental Health, Director
Norton Sound Health Corporation

T. 907.443.3311 | F. 907.443.2113 | P.O. Box 966, Nome, Alaska 99762-0966 | www.nortonsoundhealth.org

"Changing with the tides in harmony with
Our people, land and heritage."

January 18, 2022

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501

To Whom It May Concern:

I write on behalf of Qutekcak Native Tribe in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

The Qutekcak Native Tribe worked with AMQA during the 2021 Community-Based Air Monitoring Pilot Project and received an AQMesh pod to monitor local air quality. The main goal of the project was to collect baseline air quality data to assess ambient conditions in the community. Being a part of this project also means Seward is part of the wildfire smoke real-time monitoring network, allowing our local leadership to take immediate action during wildfire season and smoke events. The data is available in real-time on the publicly accessible webpage, which is a unique feature of this project compared to previous air monitoring efforts.

AMQA assisted with site selection to ensure the location met technical siting criteria, while the Qutekcak Native Tribe ensured the chosen deployment location which was representative of the community and easily accessible by our staff. Since the pod's deployment, the data has been publicly available on the AMQA webpage that The Qutekcak Native Tribe monitors on a regular basis. If elevated concentrations are seen, AMQA and The Qutekcak Native Tribe discuss possible sources and reliability of data. The data is also available for community members to use when planning community activities such as recess hours or other outdoor activities. The Qutekcak Native Tribe believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other Alaskan communities.

Sincerely,

Dolly Wiles, Tribal Administrator
Qutekcak Native Tribe

Land Management
144 N. Binkley Street, Soldotna, Alaska 99669 * (907) 714-2205 * (907) 714-2378 Fax

A Division of the Planning Department

Charlie Pierce
Borough Mayor

January 20, 2022

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, AK 99501

To Whom It May Concern:

I write on behalf of the Kenai Peninsula Borough (KPB) in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

KPB worked with AMQA during the 2021 Community-Based Air Monitoring Project and received an AQMesh pod to monitor local air quality. The main goal of the project was to collect baseline air quality data to assess ambient conditions within the community. Being a part of this project also means Soldotna is part of the wildfire smoke real-time monitoring network, allowing our local leadership to take immediate action during wildfire season and smoke events. The data is available in real-time on the publicly accessible webpage, which is a unique feature of this project compared to previous air monitoring efforts.

AMQA assisted with site selection to ensure the location met technical siting criteria, while KPB ensured the chosen deployment location was representative of the community and easily accessible by our staff. Since the pod's deployment, the data has been publicly available on the AMQA webpage that KPB monitors on a regular basis. If elevated concentrations are seen, AMQA and KPB discuss possible sources and reliability of data. The data is also available for community members to use when planning community activities such as recess hours or other outdoor activities. KPB believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other Alaskan communities.

Respectfully,

Julie Denison

Julie Denison
Land Management Technician
Kenai Peninsula Borough

NATIVE VILLAGE OF BARROW
IÑUPIAT TRADITIONAL GOVERNMENT

Barbara Trost
Department of Environmental Conservation
Division of Air Monitoring and Quality Assurance
555 Cordova Street
Anchorage, Alaska 99501

To Whom It May Concern:

I write on behalf of Native Village of Barrow in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network (Low-Cost Network), increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

Native Village of Barrow is committed to work as a partner organization with AMQA on the Low-Cost Network. If awarded funding, Utqiaġvik would be able to collect baseline air quality data to assess ambient conditions in the community. It would also mean our local leadership would have readily accessible resources for immediate decision making. Local teachers and community leaders could also use the real-time data available on the webpage to plan activities such as recess hours or local races.

AMQA will provide equipment, training, and assist with site selection to ensure the location meets technical siting criteria. Native Village of Barrow commits to work with AMQA in the pod deployment, ensuring the location is representative of the community and easily accessible by our staff, disseminating data availability to community, and reviewing data for local impacts,

Native Village of Barrow believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network would be of value to Utqiaġvik and other Alaskan communities.

Sincerely,

F. Olemaun 2-2-22

Forrest Olemaun
Tribal Council President
Native Village of Barrow

P.O. Box 1130 Barrow, Alaska 99723 • PHONE: 907-852-4411 • FAX 907-852-8844

FAIRBANKS NORTH STAR BOROUGH

AIR QUALITY DIVISION

January 24, 2022

To Whom it May Concern:

On behalf of the Fairbanks North Star Borough (FNSB) I am writing in full support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network (Low-Cost Network), increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

As a local air quality agency, FNSB has a long standing relationship with DEC and is committed to work as a partner organization with AMQA on the Low-Cost Network. If awarded funding, DEC and FNSB would be able to collect air quality data to assess ambient conditions in the Fairbanks Goldstream Valley Air Quality zone. This zone currently does not have any air monitoring data available for decision making. It would also add another site in the FNSB to be a part of the wildfire smoke real-time monitoring network, allowing us to take immediate action during wildfire season and smoke events.

FNSB believes an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network would be of value to Fairbanks and other Alaskan communities.

Sincerely,

Nick Czarnecki

Nick Czarnecki
FNSB Air Quality Manager
(907) 459-1001
nick.czarnecki@fnsb.gov

QAWALANGIN
Tribe of Unalaska

January 20, 2022

To Whom It May Concern:

I am writing in support of Alaska Department of Environmental Conservation's (DEC) Division of Air Monitoring and Quality Assurance's (AMQA) proposal to the EPA for a grant to fund Alaska's Community Low-Cost Sensor Air Monitoring Network, increasing air quality data collection and availability throughout the state of Alaska. We strongly support this grant application and its focus on increasing baseline air quality data in rural communities.

Qawalangin Tribe of Unalaska worked with AMQA during the 2021 Community-Based Air Monitoring Pilot Project and received an AQMesh pod to monitor local air quality. Due to COVID-19 related travel constraints, we have not yet installed this sensor in our community, but our intent is to continue working with AMQA to install the instrument on Unalaska in summer 2022. The main goal of the project was to collect baseline air quality data to assess ambient conditions in the community. These data will be available in real-time on the publicly accessible webpage, which is a unique feature of this project compared to previous air monitoring efforts.

We look forward to assistance from AMQA to select a location that meets technical siting criteria, working with Qawalangin Tribe of Unalaska staff to ensure the chosen deployment location is representative of the community and easily accessible by the project team. We believe an expansion of Alaska's Community Low-Cost Sensor Air Monitoring Network and extending the project for three years will be of value to our and other Alaskan communities.

Sincerely,

Chris Price
Chris Price (Jan 25, 2022 14:50 AKST)

Chris Price, CEO

QAWALANGIN
Tribe of Unalaska

PO Box 334, Unalaska AK 99685

(907) 581 2920 * Fax (907) 581 3644

Alaska's Community Low-Cost Sensor Air Monitoring Network

Cover Page

A. Project Title

Expansion and Maintenance of the Alaskan Community Low-Cost Air Sensor Network

B. Applicant Information

Applicant Organization:
State of Alaska
Address: 410 Willoughby Avenue, Suite 303
Juneau, AK 99811-1800

Contact: Barbara Trost, Program Manager Air Monitoring and Quality Assurance
Phone: (907) 269-6249
Email: barbara.trost@alaska.gov

DUNS Number: 8093868570000

C. No-Set-Aside

D. Brief Description of Applicant Organization:

The Alaska Department of Environmental Conservation Division of Air Quality (DEC) has primacy over air quality throughout the state. The Air Monitoring & Quality Assurance Program operates and oversees air quality monitoring networks throughout Alaska.

E. Project Location

Alaskan communities statewide and new sensor pod network expansion to these additional communities: Dillingham, Eagle, Fort Yukon, Galena, Haines, McGrath, and Wrangell.

F. Air Pollutant Scope

Particulate matter (PM_1, $PM_{2.5}$, PM_4, PM_{10}), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen oxides (NO and NO_2)

G. Budget Summary

EPA Funding Requested	Total Project Cost
499,999.19	499,999.19

H. Project Period

November 1, 2022, to November 1, 2025

I. Short Project Description

DEC proposes a three-year project to expand the existing air quality sensor network using AQMesh sensor pods and to provide baseline air quality data for areas not covered by the State's regulatory monitoring network. With the funding DEC will purchase and install eight additional sensor pods (seven for community install plus one audit pod), maintain the entire AQMesh sensor pod network in 33 communities and provide outreach, education, and assistance to the communities with sensors.

Section 1 - Project Summary and Approach

A. Overall Project

Outline

The Alaska Department of Environmental Conservation (DEC) Division of Air Quality, Air Monitoring and Quality Assurance Program proposes a three-year project to expand and maintain Alaska's existing air quality sensor network using AQMesh sensor pods (https://www.AQMesh.com/products/AQMesh). The Alaskan Community Low-Cost Sensor Air Monitoring Network project is intended to provide baseline air quality data for areas not covered by the State's regulatory monitoring network. The aim of this proposal is to provide a network of publicly available air quality data across the state of Alaska, to help understand impacts and sources of air pollution on historically underserved communities, and to make that information easily available to the communities themselves. Wildfire smoke, road dust from gravel roads, and other windblown dust affect every community in the state. Wintertime inversions can exacerbate air quality impacts due to home heating emissions or local power generation. Emissions from industrial activities such as oil and gas development are a concern in some communities. DEC is in the process of establishing a network of AQMesh pods which measure particulate matter (PM_1, $PM_{2.5}$, PM_4, PM_{10}), carbon monoxide (CO), sulfur dioxide (SO_2) and nitrogen oxides (NO and NO_2). With funding from this proposal, DEC will purchase and install 7 additional sensor pods, maintain the entire sensor network and provide outreach, education, and assistance to the communities with sensors. Communities that are proposed to receive the new pods are: Dillingham, Eagle, Fort Yukon, Galena, Haines, McGrath, and Wrangell. The addition of these communities will expand the existing or currently planned network to 33 sites across the state (see sensor location map in Figure 1).

State of Alaska Regulatory Air Monitoring Network

As the largest state in the United States, Alaska is approximately one-fifth the size of the lower 48 states and has a diverse population spread throughout the state (Figure 1). The State's regulatory air monitoring network has sites in the three most populous communities, but most of the state does not have any air quality monitors or data. The cost of a Federal Reference Monitor (FRM) or Federal Equivalent Monitor (FEM) along with the labor to deploy and maintain the station is prohibitive to increasing air monitoring coverage throughout the state.

The Air Monitoring and Quality Assurance Program in the Air Quality Division (hereafter referred to as 'DEC') is responsible for planning and overseeing the State's regulatory criteria pollutant monitoring network. Alaska's ambient air quality issues are primarily dominated by particulate matter. Every community in the state can be impacted annually by wildfire smoke, road dust from gravel roads, and other windblown dust. Communities in Interior Alaska, such as Fairbanks and North Pole, experience significant wintertime particulate pollution events when temperature inversions trap surface emissions at the ground level.

Air monitoring has historically focused on Alaska's largest population centers (Figure 1). Stagnant or decreasing funding for air quality assessments over the past ten years has required the program to decommission sampling sites and to reduce the monitoring to the required regulatory sites based on EPA requirements for Core Based Statistical Areas (CBSAs). The current network consists of eight sampling sites, including four in the Anchorage metropolitan statistical area (MSA), three in the Fairbanks MSA, and one in Juneau.

In addition to these CBSAs, the "larger" communities throughout the state have populations between 1,000 and 10,000. These communities are "hub" communities, i.e., regional transportation hubs that are served by larger commercial airlines and are jump-off points to the smaller communities serviced either by smaller commercial airlines or private transport. For this grant proposal, DEC is targeting resources, specifically staff time, travel funds, data access fees, supplies and equipment, for these hub communities along with a few strategically located smaller communities to provide data coverage to the most Alaskans possible and increase geospatial coverage.

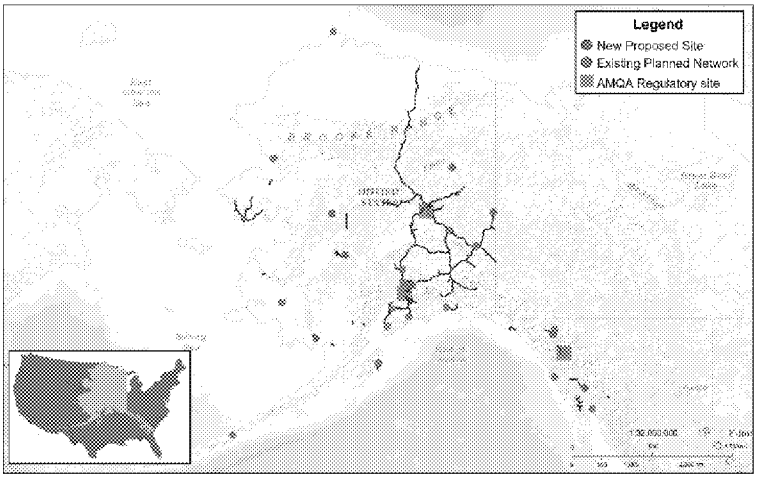


Figure 1: Map of Proposed and Installed AQMesh Install Sites with Alaskan Road System

Technology to Expand Alaska's Air Monitoring Network

The goal of the Alaska's Community Low-Cost Monitoring Network project is to use low-cost sensor (LCS) technology to help advance equity in access to air quality data across Alaska. We propose to deploy sensor pods to seven additional communities throughout Alaska that do not currently have access to local air quality information. This will expand the network to 33 communities; this includes the ten sensors pods DEC will receive through the direct American Rescue Plan grant award. The communities were selected based on location, population density, community interest, and resources available (such as electricity to power the pod and access to a cellular network).

New LCS technology provides an opportunity to collect data in areas of Alaska that have historically been underserved and yet represent most of the state. However, because LCS technology is a rapidly growing field with new sensors introduced on a regular basis, the capability of the sensors and the quality of the data is variable. Limited technology has been tested in Alaska or areas with similar climates. DEC selected AQMesh brand sensor pods for use in this project because of a record of published performance studies including use in wintertime conditions, in addition to their capability to measure PM (PM_1, $PM_{2.5}$, PM_4 and PM_{10}) and up to six gaseous parameters. DEC selected four gaseous sensors (NO, NO_2, CO, SO_2) to use in the pods alongside the PM sensor to optimize cost and monitor relevant pollutants for ambient air in Alaska. SO_2 is of particular interest to Alaska due to diesel emissions throughout the state from small diesel power plants in rural communities, cruise ships and vehicles, along with snow machines and other all-terrain vehicles, which are used for transportation throughout the year. The pods also measure relative humidity (RH), temperature, and barometric pressure (BP). Measurements are taken in 15-minute intervals for all parameters and then transmitted via

cellular network. This communication feature is critically important to Alaska since it is a very sparsely populated state with limited data and communications infrastructure. Wi-Fi connections are not easily obtained in rural and hub communities, and if they are available, the Wi-Fi is often a coveted resource for the community. A cellular connection that ranges from 2G to 5G ensures that more communities can use a sensor pod and reduces the burden on community resources, supporting DEC's decision to use AQMesh technology that can utilize broad cellular networks available in Alaska.

In 2020, DEC conducted a pilot study in southeast Alaska using AQMesh pods in coastal communities that were concerned about the impact of the cruise ship industry on local air quality. In addition to the pilot studies, DEC performed several comparison studies with the AQMesh sensor pods to (1) judge the feasibility of using the pods in the harsh Alaskan weather conditions; (2) assess the accuracy of the individual sensors in the pods; and 3) evaluate performance between the group of sensor pods to be involved in the pilot study. To address (1) and (2), one AQMesh pod was co-located with regulatory monitors at the DEC NCore site in Fairbanks for a full year, with the sensor pod measuring temperature, RH, PM, CO, SO_2, NO and NO_2. The sensor pod performed well at temperatures recorded down to -35 degrees Celsius with minimal maintenance. In general, the agreement between all sensor pod parameters and regulatory instrumentation improved when ambient particulate and gaseous levels were higher, and the correlations were worse at very low levels of pollutants. This collocation also helped to determine an adequate maintenance schedule for the AQMesh pods under typical conditions experienced in interior and northern Alaska. To address (3), ten pods were collocated in Anchorage for one month with a MetOne BAM 1020 with $PM_{2.5}$ VSCC inlet. The collocation confirmed strong correlations between the BAM and AQMesh $PM_{2.5}$ concentrations and proper function of the pods. The study allowed time for DEC staff to learn troubleshooting techniques and gain familiarity with the equipment. These collocations and intercomparisons give confidence that this technology will provide useful data for partner communities in rural and urban areas of the state.

B. Project Significance

As of the 2020 census, nearly 22% of Alaska's population identified with the census category of American Indian or Alaska Native or a combination. There are 229 Federally recognized Tribes in Alaska. Approximately one-third of Alaska's population lives in small rural communities of less than 1,000 residents; however, the incidence is significantly higher for Alaska Natives, with two-thirds of the population spread out across over 200 remote villages[1].

DEC has worked with individual Tribes on air monitoring projects since about 2000. Early in this collaboration road dust was identified as one of the main air quality concerns in rural communities. On a dry summer day, dust levels can easily reach into the mid 300 $\mu g/m^3$ range with maximum concentrations easily exceeding 500 $\mu g/m^3$. The rural dust problem was identified and documented when the State Department of Transportation (DOT) secured funding for several long-term joint-monitoring efforts among DEC and Tribal environmental staff. Solving this problem is extremely costly, and DEC continues to work with EPA, Alaska DOT, the University of Alaska Fairbanks and Tribal communities to find suitable solutions to this issue, including the use of palliatives and improving techniques for their application. In recent

[1] Hudson, Heather, After Broadband: Results of a Study in Rural Alaska (April 1, 2015). Available at SSRN: https://ssrn.com/abstract=2588307

years DEC has only been able to support very few rural Alaska monitoring projects focused on these concerns mainly due to budget cuts. Road dust remains a primary air quality concern in rural Alaska, and the AQMesh pods will provide monitoring data and support to impacted communities.

Wildfires are part of the ecosystem in Alaska's boreal forest and tundra. Research suggests that wildfires are burning more acres, expanding into new areas of the state, burning more frequently or reburning the same location, and increasingly overwintering and flaring up again in spring[2]. The smoke from wildland fires not only affects the areas with active fires but can impact regions far from the source. DEC collaborates with Alaska Fire Service (AFS) and US Fish and Wildlife Service (USFWS) by providing data from the limited regulatory air monitoring network and air quality assessments using visibility information interpreted by the DEC's Air Quality Meteorologist. In the past DEC combined resources with AFS and USFWS to create a limited seasonal network of LCSs that could be deployed to areas surrounding wildfires on a short-term basis. However, there remains an urgent need for a reliable long-term wildfire monitoring network, which would be achieved by this AQMesh network. Determining present and future estimates of the impact of wildfire smoke on rural communities is difficult since the regulatory air quality monitoring network is limited to urban areas such as Fairbanks and Anchorage[3]. Woo et al. 2020 estimate that future climate change scenarios will expose nearly all Alaskan communities to increases in $PM_{2.5}$ from wildfires, and interior Alaskan communities which already have a high burden of $PM_{2.5}$ pollution (such as the FNSB) may experience increases in wildfire-sourced $PM_{2.5}$ on the order of 150-350% in coming decades.

Rural Alaskans are at a higher risk for various respiratory infections, but until recently, most research has focused on indoor air quality. Overall, Alaska Native children experience more respiratory illnesses and infants are hospitalized at two to three times the rate of the rest of the US[4]. Strong winter inversions in Interior Alaska coupled with weak economies, higher home heating bills, and easy access to wood have perpetuated woodstove use in rural and urban communities and lead to $PM_{2.5}$ wood smoke problems in ambient air in addition to the known indoor conditions.

Section 2 - Community Involvement

A. Community Partnership

With the support and guidance of DEC, the project partners (see letters of support in Attachment 2) will lead the siting effort, installment, and monitoring of the pod during its deployment. Since the partners know their communities best, they provide invaluable context for ambient air quality conditions and community behaviors to ensure the pod is installed in the most appropriate and beneficial location for all residents. DEC provides training and resources to partners to use, install, and maintain the AQMesh pods so local staff gain experience. DEC also provides long-distance troubleshooting support in case of technical difficulties or will travel to a community for repair if needed. Partners may monitor the real-time data on the DEC website to check for

[2] Grabinski, Z. and H.R. McFarland (2020). Alaska's Changing Wildfire Environment. https://uaf-iarc.org/alaskas-changing-wildfire-environment.
[3] Woo, S. H. L., et al. (2020). Air pollution from wildfires and human health vulnerability in Alaskan communities under climate change. Environmental Research Letters, 15(9), 094019.
[4] Peck, A. J., et al. (2005). Lower respiratory tract infections among American Indian and Alaska Native children and the general population of US children. *The Pediatric infectious disease journal*, *24*(4), 342-351.

elevated concentrations, reliable reporting, and trends of interest. They can share the online data resources on their own websites, with staff or through word of mouth when working directly with their communities. Partner organizations have a wide array of experience and technical knowledge. Not all the partners have direct ambient air quality experience, but most of the community contacts work in an environmental health sector and have an interest in and some familiarity with air quality.

B. Community Engagement

DEC acknowledges that community engagement is an integral aspect of the established Community Low-Cost Sensor Air Monitoring Network. DEC solicits partners by reaching out to organizations and Tribes within the community and asking if staff have interest and availability to conduct ambient air quality monitoring. The partners help design the project at the local level by finding a suitable location to install the pod and help brainstorm the best methods of communication for their community members. DEC engages the communities through workgroup calls, public meetings, presentations, and interactions with the schools. The broader community, not just the direct partner, can provide input on the project with the direct methods of communication outlined on DEC's real-time data website, public meetings or through discussions with our partner organization. The data collected by the pods is provided in real-time via the DEC webpage that shows a map with NowCast AQI color coding along with time series plots of the last 72 hours of data collected.

Section 3 - Environmental Justice and Underserved Communities

A. Environmental and Health Outcome Disparities

Alaskans face myriad obstacles to adequate health care including financial burden, distance/remoteness, and a dearth of providers. According to the 2020 US Census the median per capita income in Alaska for 2019 was $36,787 and 9.6% of Alaskans were living in poverty. Annually, Alaskans pay an average of $11,064 per capita for health care, which is the highest cost of any other state in the US[5]. Around 32.6% of Alaskans live in rural areas, and roughly 78% of the population of these remote rural areas are Alaska Native according to the 2020 Census. There are 229 federally recognized tribes in Alaska with roughly 140,000 people, mainly in roadless areas. Across the state, 86% of Alaskan municipalities and boroughs are not connected to a major road system. As of 2021, 61% of Health Professional Shortage Areas (HPSAs) in the US were in rural areas, and in Alaska, 96% of the state is designated as a HSPA with most of the shortage falling in rural areas[6]. In Alaska only 13 critical access hospitals, 37 federally qualified health centers, 4 short-term/PPS hospitals, and zero rural health clinics are located outside of urbanized areas[6]. Villages lacking health care facilities may be serviced by an itinerant health care provider that is shared among several villages. Often these professionals provide routine check-ups but are not on-hand for emergency care. Many rural Alaskans do not use English as their primary language, impacting their access to health care even when a provider is present[7]. To see medical professionals outside of the village, they must fly to a hub community, like Nome or Bethel, and then on to larger cities, like Fairbanks and Anchorage.

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[5] Kaiser Family Foundation. "Health Care Expenditures per Capita by State of Residence" (2018).
[6] Rural Health Information Hub (accessed 2021) https://www.ruralhealthinfo.org/states/alaska
[7] Allhoff, F., & Golemon, L. (2020). Rural bioethics: the Alaska context. In HEC Forum, 32, 4, pp. 313-331. Springer Netherlands

Studies have found significant associations between mortality and long-term exposure to $PM_{2.5}$. Ecological regression analyses have shown that a 1 ug/m^3 increase in long-term average $PM_{2.5}$ concentration is associated with an 11% increase in COVID-19 mortality rate[8]. Moreover, mortality rates in rural areas have been shown to be higher in part due to limited access to health care/faster emergency response times, poorer health behaviors (smoking, etc.), and a lack of information about dangerous health conditions (like stroke and heart attacks)[9]. These disparities have led researchers to apply a "non-metropolitan penalty" to rural vs urban studies, but the penalty highlights the inequities in health outcomes between the rural and urban setting. This meets the definition of environmental justice – their remoteness, alone, creates a disproportionate negative health outcome for these individuals.

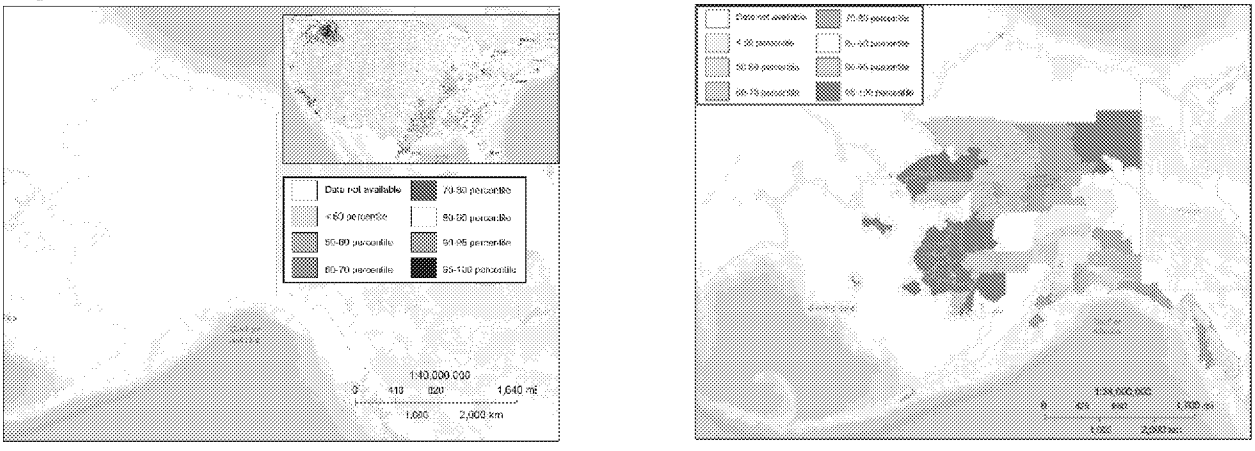

Figure 2: EJScreen Data for Alaska PM2.5 Data Availability with Inlay Showing PM2.5 Data for Lower 48 (left) and EJScreen Data for Demographic Indicators in Alaska (right).

B. Pollution Exposure and Access to Data

Rural communities in Alaska are exposed to air pollution from sources including wildfire smoke, road dust from gravel roads, and other windblown dust. Local emission sources, such as open burning in landfills, use of burn barrels, industrial activities, and diesel power generation also impact local air quality in Arctic communities of rural Alaska[10,11]. However, monitoring to determine the scale of air quality impacts from sources such as these is lacking across the state. $PM_{2.5}$ is not currently available from the EJScreen[12] tool for Alaska (Figure 2 left), despite the Fairbanks North Star Borough consistently ranking as one of the most polluted areas in the US for $PM_{2.5}$ and frequent seasonal impacts from wildfire smoke. Low-income areas, as shown in Figure 2 (right) derived from EJScreen, are located across Alaska within urban areas and including rural communities that are not accessible by the state's limited road system. Income barriers present challenges to addressing health outcomes from pollution exposure and to dealing

[8] Wu, X et al. (2020). Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. Science advances, 6(45), eabd4049.
[9] Garcia, C. A., et al. (2016). Association of long-term $PM_{2.5}$ exposure with mortality using different air pollution exposure models: impacts in rural and urban California. Int. Jour. of Environ. Health Research, 26(2), 145-157.
[10] Gunsch et al. (2019). Diesel Soot and Amine-Containing Organic Sulfate Aerosols in an Arctic Oil Field. Environ. Sci. Technol. 54, 1, 92-101.
[11] Schmale J. et al. (2018) Local Arctic air pollution: A neglected but serious problem. Earth's Future, 6, 1385-1412. https://doi.org/10.1029/2018EF000952.
[12] United States Environmental Protection Agency. 2022 version. EJScreen. Retrieve: March 5, 2022 from https://EJScreen.epa.gov/mapper/.

with local pollution sources in urban areas such as Fairbanks, where the combination of local meteorological conditions and homes heated with the lowest cost fuel (wood) leads to significant wintertime particulate pollution events.

Section 4 - Environmental Results – Outcomes, Outputs and Performance Measures

This proposed project meets the EPA's Strategic Plan to advance environmental justice by engaging with communities on key activities, assessing ambient concentrations of air pollution and making air quality data available in real-time on DEC's website.

A. Expected Project Outputs and Outcomes

Table 1: Outputs and Outcomes

Outputs	Outcomes
Install AQMesh pods in seven communities, one pod will be used for auditing purposes	Evaluate the threat to public health through ambient air quality measurements and identification of local air quality impacts
Addition of 1 long term non-permanent full-time employee dedicated to the installation of the AQMesh sensor pods and management of the data	Accelerate installation and provide better maintenance and data collection and interpretation support to the communities with sensor pods.
Wildland fire smoke data available on real-time data website for public access	Provide real-time data for local awareness and support mitigation strategies and activities. Protect public health by issuing air advisories when pollution is expected to reach the 'Unhealthy for Sensitive Group' level or above.
Outreachand engagement with community	Community specific assessment of air pollution data, outreach to communities on the risks of air pollution and investigate local pollution sources.
Educational material	Increase community awareness and develop local mitigation strategies to reduce human exposure to local air pollution, specifically wildfire smoke and road dust. Provide materials to interested community leaders to educate students or interested parties in ambient air quality concepts.
Baseline data for areas that have very little or no air quality data (Establish database of hourly data collected at entire network over the project period)	Partnerships and identification of potential longer term air monitoring sites for wildfire, or other identified air pollution sources. Monitoring results are recorded and available to the public from this ambient monitoring projects.

This project will fund the installation of AQMesh pods in seven underserved communities across the state, all of which either have no prior air quality monitoring data for the area or are in an area with high air pollution but not covered by an air monitor. DEC will collect three years of baseline gaseous criteria pollutant data (except for ozone, since ozone is not a problem in Alaska) and baseline PM data year-round for the 33 communities in the entire network. The data will be displayed on the State's website, will provide real-time AQI information and will be used to issue air quality advisories should local concentrations reach 'unhealthy for sensitive groups' levels or above. DEC will work with local communities to identify localized air pollution sources, develop better understanding of air quality and impacts to health, and work with the local environmental staff, Tribal environmental offices and schools to develop tailored outreach and educational materials. DEC will support local communities in the development of mitigation measures and other strategies to reduce emissions. If the monitoring data document manmade air quality impacts, DEC will consider if a more sophisticated long-term monitoring method is appropriate for the location. A summary of outputs and outcomes is laid out in Table 1.

B. Performance Measures and Plan

DEC will develop a project plan and determine an installation timeline with our partners. All sensor pods will be performance tested for 2-4 weeks prior to field deployment, with the entire network operational no later than July 1, 2023. DEC will submit a copy of our draft Quality Assurance Project Plan (QAPP) to the EPA R10 office for review. Upon network installation, DEC will establish routine quarterly network calls with all participating communities to discuss

the monitoring data and start work on educational and outreach information. DEC will use the real-time data during the wildland fire season to issue air quality advisories. DEC will provide semiannual data reports to the communities. DEC will work with the partner communities to troubleshoot and repair any of the sensor pods and as needed. DEC staff will either travel to the community or request the pod to be shipped back to the office where more rigorous testing, troubleshooting, and repair can be conducted. The intent is to keep data gaps to a minimum and return the pods to the community within 30 days if possible. DEC will work with the community partners and prepare or support the preparation of presentations at air quality conferences.

C. Timeline and Milestones

Figure 3: Timeline and Milestones

Project Timeline	CY 2022	CY 2023				CY 2024				CY 2025			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Grant Award													
Project Implementation													
Hire additional staff													
Order AQMesh sensor pods													
Engage with communities to receive pods													
Finalize QAPP													
Install AQMesh pods													
Data collection													
Quarterly network calls													
Develop outreach materials													
Semiannual data reports													
Presentations at ATCEM													
Presentations at AFE													
Replace aging sensors as needed													
Create baseline data sets													
Final Project report													
EPA Reporting													
Quarterly progress reports													
Final Project report due to EPA													

As soon as the grant is awarded, DEC will start procurement of the eight AQMesh sensor pods. DEC will also recruit for a new long-term non-permanent position, which will be tasked with installing and maintaining the AQMesh sensor pods. The new hire will work with the DEC Quality Control Officer on finalizing the project Quality Assurance Project Plan and contact the partnering communities to identify preliminary sampling site options. As shown in Figure 3, the sensor installation will occur in Q1 through Q3 of CY23, with data collection extending through Q3 of CY25. DEC will establish quarterly calls with the partnering communities and agencies in the network and any other interested parties statewide. DEC will work with the partner to develop outreach materials and develop semiannual data reports to be shared with the network partners. DEC will present at the annual conferences like the Alaska Tribal Conference on Environmental Management (ATCEM) and Alaska Forum on the Environment (AFE) and others per request or support a network partner, should they choose to present. At the end of the project, DEC will consolidate the data into a multi-year baseline dataset for use by the communities or agencies in future planning processes. DEC will provide quarterly progress reports according to the EPA schedule and submit a final project report within 120 days of the end of the grant.

Section 5 – Quality Assurance Statement

DEC developed a draft Standard Operating Procedure (SOP) and is currently finalizing a draft QAPP detailing the project measurement quality objectives. For more detail see Attachment 1.

Section 6 - Programmatic Capabilities and Past Performances

A. Past Performance

DEC is responsible for grant oversight and fulfilling grant reporting requirements, including semiannual reports and final project reports. DEC will manage the grant in accordance with the Uniform Grant Guidelines. The DEC Division of Air Quality (the Division) will monitor all work conducted under this award. The Division has demonstrated programmatic and financial capability, successful implementation, and timely reporting through the historical and ongoing successful management of the State of Alaska's other air quality specific EPA grants:

- CFDA 66.605 – Performance Partnership Grants
  - Clean Air Act 105 & Radon
- CFDA 66.034 – Surveys Studies Investigations, Demonstrations and Special Purpose Activities relating to the Clean Air Act
- CFDA 15.236 – Environmental Quality and Protection

B. Reporting Requirements

DEC has a long history of partnering with other agencies to implement both federal and state funded programs. DEC commits to timely submission of the quarterly progress reports and a detailed final project performance report in accordance with the programmatic reporting grant term and condition. The quarterly report will describe progress on completion of work plan commitments, provide a discussion of the work performed for all work plan components, and include a discussion of any existing or potential problem areas which could affect project completion and what measures will be taken to address or correct the identified problem.

C. Staff Expertise

The staff who will be responsible for the various elements of the project have many years of experience managing and overseeing different types of projects. After project award DEC will advertise for one full-time position starting in the fourth quarter of 2022. The incumbent will be trained on the sensor technologies and general monitoring methodologies and quality assurance and will work closely with the QA Officer, Data Analyst and Program Manager. A brief description of their experience and responsibilities can be found in Attachment 3.

Section 7 - Budget

A. Budget Detail

Table 2 summarizes the budget details and project assumptions are discussed below.

Salary: The budget includes staff time (salary) for the three-year project for project management at 2% FTE of the Program Manager per year, review and oversight by the QA officer at 2% FTE per year, training and data analysis by a data analyst at 5% FTE per year and a dedicated field staff person for installation, data collection, validation, reduction and reporting, and sensor troubleshooting and repair. DEC estimates the field duties will require 75% FTE. DEC plans to hire a new nonpermanent project position. The total salary cost for the project is $142,829.19.

Fringe Benefits: Fringe benefits are actual budgeted fringe cost for these individual positions in the upcoming budget year and include leave cash-in, risk management, unemployment insurance, terminal leave, retirement benefit, health insurance, life insurance, legal trust fund, SBS (Supplemental Benefit System), and Medicare. Fringe total is $100,215.24.

Table 2: Budget Detail

Alaska's AQMesh Sensor Pod Network Expansion Cost Estimate	EPA Funding in US Dollars
Personal Services -Salary	**142,829.19**
Project management- FTE EPM 2 - 2% over 3 years, i.e.0.06 x $114,547	6,872.82
Project operations- FTE EPS 2 - 75% over 3 years = 2.25 x $53,632	120,672.00
Project operations- FTE EPS 3 - 5% over 3 years = 0.15 x $71,507	10,726.05
QA - FTE Chemist 4 - 2% over 3 years = 0.06 x $75,972	4,558.32
Personal Services -Fringe	**100,215.24**
Project management- FTE EPM 2 - 2% over 3 years, i.e.0.06 x $62,718	3,763.08
Project operations- FTE EPS 2 - 75% over 3 years = 2.25 x $38,604	86,859.00
Project operations- FTE EPS 3 - 5% over 3 years = 0.15 x $45,210	6,781.50
QA - FTE Chemist 4 - 2% over 3 years = 0.06 x $46,861	2,811.66
Travel	**34,500.00**
Installation- 7 trips to communities off the road system, airfare Avg Anchorage to Rural Hub $600, Hotels/Meals/Transportation (per day x 2) $275	9,200.00
17 QA/QC (10 existing + 7 new sites off the road system) visits: airfare Avg Anchorage to Rural Hub $600, Hotels/Meals/Transportation (per day x 2) $275	19,550.00
5 Troubleshooting/repair trips: airfare Avg Anchorage to Rural Hub $600, Hotels/Meals/Transportation (per day, x 2) $ 275	5,750.00
Contractual	**68,230.00**
Cellular connection and monthly data transfer fee $420 per pod, per year = 36 x 2 yr, 1st yr included in equipment purchase)	30,240.00
Standard customer AQMesh data access. $420 is per pod, per year. Minimum data resolution is 10 minutes for gas and PM. (x 36, 1st year included in equipment purchase)	30,240.00
Shipping - (pods shipping from manufacturer, pods and other supplies to communities over life of the project)	2,500.00
Community MOU and Land Use Agreements	5,250.00
Supplies	**44,192.20**
Field supplies (e.g. extension cords, attachment brackets, outlet cover, sensor cleaning supplies, replacement power supplies, antennas, other AQMesh specific equipment)	4,045.00
Replacement sensors for the 36 pod network, i.e. 36 x 4 gas sensors. Anticipated replacement needed once every 2 years of operation. Sensor cost $328. 15% discount at 30+ sensors -> $278.80/sensor at discount	40,147.20
Equipment	**65,920.00**
AQMesh pod with particulate matter sensors (PM1, PM2.5, PM4, PM10) and four gases (NO, NO2, CO, SO2), temperature, RH, BP, including waterproof power supply and heated inlet for PM sensors	65,920.00
Indirect (SFY22 IDC Rate 18.15% applied to Salary and Fringe)	**44,112.56**
Project total	**499,999.19**

Travel: Travel cost estimates focuses on travel to communities that are not on the road system and only accessible by plane. These trips include sensor pod installation in seven communities in this proposal, 17 trips are planned to collocate the dedicated audit pod for sensor intercomparison over the course of the project period in the 17 network communities that are off the road system and five troubleshooting and repair trips. A standard average air fare from Anchorage to a hub community is assumed at $600, with per diem calculated to $275 per day for hotel, meals, and local transportation. Total travel costs for the entire project are estimated at $34,500.

Equipment: DEC will purchase eight AQMesh sensor pods with PM (PM_1, $PM_{2.5}$, PM_4, PM_{10}), SO_2, CO, NO and NO_2 sensors, heated inlets, and waterproof power supplies for placement in seven communities and one pod for rotating QC comparison. A 25 % bulk discount is applied for the purchase of eight AQMesh pods. A single pod with power supply and heated inlet costs $10,690. With the discount applied the total equipment cost will be $65,920.

Contractual: Contractual expenditures cover shipping, agreements, and data transfer and data access fees. DEC enters Memorandum of Understandings (MOU) with Tribal and local governments to cover cost incurred by them like electrical power installation and consumption. DEC assumes to establish seven MOUs at an average cost of $750 per agreement. Shipping costs include shipment of sensor pods to DEC and pods and field supplies to and from communities from the Anchorage DEC office for installation, troubleshooting and repair. Data transfer fees at $420 per pod per year and data access fees of $420 per pod per year are assessed for all 36 pods

in the network for the second and third project year; the fees for the first year are included in the purchase price of the pods. Total contractual costs are $68,230.

Supplies: Supplies include replacement gaseous sensors for each of the 36 pods in the entire network at $278.80 per sensor and field supplies like extensions cords, mounting brackets, outlet covers and pod cleaning supplies. Gaseous sensor replacements are anticipated after two years of operation per manufacturer specifications. Total supply costs are estimated at $44,192.

Indirect rate: Indirect costs are assessed at 18.15% of personnel costs (salary and fringe) for a total of $44,112.56.

B. Reasonableness of Cost

Monitoring is always expensive, but especially so in a large state like Alaska where distances between communities are great, and many communities are only accessible by air. For this proposal DEC only budgeted travel to the communities off the road system. The selected monitoring technology allows baseline data collection for most of the criteria pollutants in one instrument, thereby maximizing staff time and travel to collect air quality information for the first time ever for many of these communities. DEC is dedicating ¾ of a journey level position to the project with oversight by experienced staff, to ensure the project partners have access to resources and support, and to maximize data collection. By partnering with local and Tribal communities and organizations, DEC is leveraging local support at the same time establishing a network of new air quality champions for long term engagement.

C. Expenditure of Awarded Funds

DEC has Division of Administrative Services (DAS) staff to assist with transactions and grant compliance. This includes a dedicated Federal Grants Desk designed to assist Divisions with award submission, reporting, and closeout. In addition, the Division of Air Quality employs a dedicated accountant who tracks and monitors the status of each grant on a weekly basis. Quarterly projections completed in cooperation between Division Administrative staff and Program staff provide a detailed analysis of year-to-date expenditures and planning for future expenditures to ensure that awards are spent in a timely and efficient manner. The Program Manager in charge of this proposal has 15 years of experience of successfully managing grant awards. All expenditures are reviewed for Federal eligibility by program and administrative staff prior to being submitted for validation by DAS staff.

Section 8 – Attachments

Attachment 1 contains the Quality Assurance Statement, Attachment 2 includes the Letters of Support from our partners, and Attachment 3 presents the resumes of key personnel.